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Verbal Ability and Delinquency: Testing the Moderating Role of Psychopathic Traits

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## Abstract

**Background:** Impaired verbal abilities are one of the most consistent risk factors for serious antisocial and delinquent behavior. However, individuals with psychopathic traits often show serious antisocial behavior, despite showing no impairment in their verbal abilities. Thus, the aim of the current study was to examine whether psychopathy moderates the relationship between verbal abilities and delinquent behavior in a sample of detained youth.

**Methods:** The sample included 100 detained adolescent boys who were assessed on self-reported delinquent acts and psychopathic traits, as well as their age at first offense based on official records. Participants also completed a competitive computer task involving two levels of provocation, during which skin conductance was measured. A standard measure of receptive vocabulary was individually administered.

**Results:** As predicted, there was a significant interaction between callous-unemotional (CU) traits (a critical dimension of psychopathy) and verbal ability when predicting violent delinquency. Individuals who were high on CU traits with higher scores on the measure of verbal abilities reported the greatest violent delinquency. These individuals also showed the lowest level of skin conductance reactivity during the provocation task.

**Conclusions:** The results suggest CU traits are an important moderator of the relation between verbal abilities and violent delinquency.

**Keywords:** Callous-unemotional traits; psychopathy; autonomic reactivity; skin conductance; verbal ability; violence

### Verbal Ability and Delinquency: Testing the Moderating Role of Psychopathic Traits

Research shows that youth with verbal deficits are much more likely to engage in delinquent behavior (Cornell & Wilson, 1992; Leech, Day, Richardson, & Goldschmidt, 2003; Moffitt & Henry, 1991; Stattin & Magnusson, 1995; Vermeiren, De Clippele, Schwab-Stone, Ruchkin, & Deboutte, 2002). This deficit appears to be at least partially independent of such potential confounds as ethnicity and SES (Petee & Walsh, 1987; Moffitt, 1994) and cannot be solely attributed to differential detection and arrest of less intelligent antisocial individuals (Moffitt & Henry, 1991).

The robust relationship between verbal deficits and delinquency has led to the proposal of a number of theories to explain this link. For example, one proposal asserts deficient verbal abilities could relate to impaired executive functioning, which is critical for behavior regulation (Moffitt & Henry, 1991). In addition, several findings suggest that higher intelligence in general (Leech et al., 2003), and higher verbal abilities specifically (Lahey, Loeber, Burke, & Rathouz, 2002; White, Moffitt, & Silva, 1989; Cornell & Wilson, 1992), act as protective factors to reduce the likelihood of delinquent behavior in individuals with other risk factors.

However, one notable exception to these findings comes from a longitudinal study by Lahey and colleagues (1995). In this study, there was an interaction between intelligence and family history of antisocial behavior in predicting the stability of conduct problems over 4 years in a clinic-referred sample of children (ages 7–12 at initial referral). Specifically, in children without family histories of antisocial behavior, higher intelligence was associated with less stability of conduct problems. In children with a biological parent who had a history of antisocial personality disorder, higher intelligence predicted greater stability of conduct

problems. Thus, at least for some youth, higher levels of intelligence were associated with more severe antisocial behavior.

Such findings are consistent with theoretical conceptualizations of psychopathy. That is, definitions of psychopathy focus on the presence of specific affective (e.g., callousness, unemotionality, and lack of empathy and remorse), interpersonal (e.g., manipulateness, lying, and a grandiose sense-of-self) and behavioral features (e.g. impulsivity, irresponsibility) and often include average to above-average intelligence as one characteristic that distinguishes individuals with these features from other antisocial individuals (Cleckley, 1976; Harpur, Hare, & Hakstian, 1989; Salekin, Neumann, Leistico, & Zalot, 2004). Further, incarcerated adults with psychopathic traits often show the most severe and chronic patterns of aggression and violence (Gendreau, Goggin, & Smith, 2002; Hemphill, Hare, & Wong, 1998; Walters, 2003). Thus, the role of intelligence in predicting aggression, violence, and other indices of severity may be different for persons with and without psychopathic traits. Consistent with this contention, Johansson and Kerr (2005) reported that psychopathic incarcerated adult offenders with the highest intelligence quotients, and particularly verbal quotients, showed the most severe offense history, including violence. In contrast, non-psychopathic incarcerated offenders with high intelligence quotients evinced the least problems. Thus, although the presence of psychopathy was not related to higher verbal abilities as theories of psychopathy would suggest, the presence of both psychopathy and high verbal abilities was associated with greater problems (Johansson & Kerr, 2005).

In samples of antisocial youth, certain traits similar to those in psychopathic adults could moderate the relation between intelligence and severity of delinquency and violence. Specifically, the presence of callous-unemotional (CU) traits, narcissism, and impulsivity seem to designate a particularly severe, aggressive, and stable group of antisocial youth (see Frick & Dickens, 2006 for a review of 24 published studies documenting this link). Further,

in clinic-referred children with conduct problems, a deficit in verbal intelligence was only evident in children without CU traits, whereas children with conduct problems and CU traits evinced a normative range of intelligence (Loney, Frick, Ellis, & McCoy, 1998).

Research findings remain unclear whether the CU dimension is the most important for examining intelligence's relation to delinquency and violence. For example, the deceptive and manipulative behaviors associated with narcissism may rely heavily on intact verbal abilities (see Salekin et al., 2004). In fact, the interpersonal dimension (i.e., narcissism) of psychopathy was the only factor that was positively related to intelligence in adults (Vitacco, Neumann, & Jackson, 2005). Being able to wield one's words can be helpful if one wants to lie and influence others to do what one wants. Further, using one's words effectively and being amenable to the use of one's verbal abilities to charm and manipulate others may be especially problematic. Thus, research examining the three dimensions separately is necessary, especially into how high verbal abilities in some youths may indicate greater severity of delinquency and violence.

Finally, few studies have examined the role of verbal ability in the context of other important factors that may predict risk for violence and aggression. Specifically, intact verbal abilities alone are unlikely to suggest risk for antisocial and aggressive behaviors. However, intact verbal abilities could indicate risk for individuals who have other risk factors for aggression and violence. For example, in samples of adults (Levenston, Patrick, Bradley, & Lang, 2000; Patrick, Bradley, & Lang, 1993; Williamson, Harpur, & Hare, 1991) and youth (Blair, Colledge, Murray, & Mitchell, 2001; Kimonis, Frick, Fazekas, & Loney, 2006; Loney, Frick, Clements, Ellis, & Kerlin, 2003), individuals high on psychopathic traits exhibit deficits in responding to negative emotional stimuli. Thus, it may be that emotional deficits in youths high on psychopathic traits, and not higher verbal intelligence per se, are associated with more severe aggression and violence.

To address these limitations, the present study examined the interaction between verbal ability and the dimensions comprising psychopathic traits in predicting various indices of serious delinquency and in predicting psychophysiological measures (indexing emotional reactivity). It was predicted that a significant interaction would emerge: less serious and less violent delinquency would be evident in youths with high verbal abilities and low psychopathic traits, but more serious and violent delinquency in those with high verbal abilities and high psychopathic traits. Based on past research, one could predict either the CU or narcissistic dimensions of psychopathy, but not the impulsive dimension, leading to this interaction. Finally, an interaction between psychopathic traits and verbal abilities was predicted to emerge when examining psychophysiological measures. Low reactivity was hypothesized to be shown in youths with high psychopathic traits, and this low reactivity was assumed to explain the more severe delinquency for individuals with these traits despite relatively better verbal abilities.

## Method

### *Participants*

All parents of youths currently housed at a local juvenile detention center with a valid phone number were contacted by a detention center staff member. The staff member informed parents or legal guardians that a study was being conducted by researchers at a local university and asked permission to forward their information to the researcher. One hundred twenty-six parents were contacted by the research staff and 117 (93%) gave consent. Out of those 117, five boys (4%) were released before they could be contacted and 10 (9%) declined to give assent. Two boys were eliminated due to a failure to complete all measures.

The final sample included 100 boys between the ages of 13 and 18 ( $M=15.53$ ,  $SD=1.28$ ). The majority (69%) of the sample self-identified as African-American and 22% as Caucasian, which is representative of the ethnic composition of the detention center

population. Based on self-report, 17% were taking psychotropic medications<sup>1</sup>, 50% had previous placement in special education, and 69% had a history of mental health treatment.

### *Procedures*

When parents were contacted by telephone about their child's participation, they were informed that their child's participation in the project would in no way influence his treatment at the detention center or his legal standing in the adjudication process. As approved by the University of New Orleans Institutional Review Board and the director of the detention center, parents or legal guardians who agreed to have their child participate were asked to have the consent process tape-recorded and were subsequently mailed a copy of the consent form for their records.

For boys, whose parents provided consent, the following procedures were followed. First, boys individually met with two examiners in a private room at the detention center and were fully informed about all procedures, including the voluntary nature of participation. The youth signed the assent form if he agreed to participate. Second, two Ag-AgCl electrodermal conductance electrodes were attached to the distal phalanges of the two middle fingers of the non-dominant hand to measure skin conductance. Third, the standard script about the provocation task was read to each participant and they were told that the sensors would record their physiological activity. Fourth, the participant completed the Peabody Picture Vocabulary Test-3<sup>rd</sup> Edition (Dunn & Dunn, 1997). Fifth, later in the day, and at least half an hour following the initial session, all participants tested that day completed questionnaires as a group (ranging from 1 to 4). The questionnaires were read aloud to all participants with an assistant available to answer questions and to ensure the adequate and private completion of every item. Sixth, the group was then given their choice of soft drink and candy as compensation. Seventh, a letter was sent to the participant's home thanking him for his participation and debriefing him and his parent(s) about the deception used for the



provocation task. This debriefing was done following release from the center to avoid the participants sharing information with other potential participants.

### *Measures*

*Antisocial Process Screening Device (APSD; Frick & Hare, 2001).* The APSD is a 20-item behavior rating scale with each item scored either 0 (Not at all true), 1 (Sometimes true), or 2 (Definitely true). The published version of the APSD was designed to be completed by parents and teachers and a factor analysis revealed three dimensions: a 7-item Narcissism dimension, a 5-item Impulsivity dimension, and a 6-item Callous-Unemotional (CU) dimension (Frick, Bodin, & Barry, 2000). A self-report version of the APSD was shown to have a similar factor structure in detained adolescents (Vitacco, Rogers, & Neumann, 2003), designates a more severe and violent group of juvenile offenders (Caputo, Frick, & Brodsky, 1999; Kruh, Frick, & Clements, 2005; Spain, Douglas, Poythress, & Epstein, 2004), and designates juvenile offenders with distinct emotional and cognitive characteristics (Loney et al., 2003; Pardini, Lochman, & Frick, 2003). However, the CU subscale has shown poor internal consistency in the self-report format (Loney et al., 2003; Pardini et al., 2003; Poythress, Dembo, Wareham, & Greenbaum, 2006; Muñoz & Frick, 2007). Thus, only the Narcissism and Impulsivity subscales from the APSD were used and they showed adequate internal consistency (.72 and .60, respectively).

*The Inventory of Callous-Unemotional Traits (ICU; Frick, 2003).* The ICU is a 24-item self-report scale designed to provide a more extended assessment of CU traits than the APSD. The ICU was derived from the Callous-Unemotional subscale of the APSD (Frick & Hare, 2001) by using the four items that loaded significantly on the CU scale in factor analyses in both clinic-referred and community samples (Frick et al., 2000). These four items (“is concerned about the feelings of others,” “feels bad or guilty,” “is concerned about schoolwork,” and “does not show emotions”) were restructured into four positively and four

negatively worded items and placed on a four-point scale (0 = “not at all true,” 1 = “somewhat true,” 3 = “very true,” and 4 = “definitely true”). The construct validity of the ICU was supported in a large sample ( $n = 1443$ ) of non-referred German adolescents ages 12 to 18 (Essau, Sasagawa, & Frick, 2006) and a moderate sized ( $n=248$ ) sample of juvenile offenders ages 12 to 20 in the United States (Kimonis et al., in press). In both samples, factor analyses revealed three factors (callousness, uncaring, and unemotional) loading on a single higher-order factor and the total scale showed predicted associations with severity of conduct problems, aggression, delinquency, and several personality measures (e.g., thrill and adventure seeking). In the current detained sample, two items (“What I think is “right” and “wrong” is different from what other people think,” and “I do not let my feelings control me”) showed poor relations with the other items on the scale and were removed. The total ICU score was the sum of the remaining 22 items (reverse-scoring 12 of the items), which showed acceptable internal consistency (.74).

*Peabody Picture Vocabulary Test-3<sup>rd</sup> Edition (PPVT-III; Dunn & Dunn, 1997).* The PPVT-III is a brief norm-referenced measure of verbal ability for those ages 2.5 to 90 years. This test assesses a child’s receptive language abilities. Research shows a strong correlation between the total score of the PPVT-III and the Full-Scale IQ ( $r = .90$ ) and Verbal IQ scores ( $r = .91$ ) from the Wechsler Intelligence Scale for Children, Third Revision within a sample of 41 children ages 7 year, 11 months through 14 years, 4 months (Dunn & Dunn, 1997). The PPVT-III was also validated using the Kaufman Adolescent and Adult Intelligence Test with 28 adolescents age 13 years through 17 years, 8 months (Dunn & Dunn, 1997).

*Self-Report of Delinquency (SRD; Elliott & Ageton, 1980).* The SRD was developed from a list of all offenses reported in the Uniform Crime Report with a juvenile base rate of greater than 1% (Elliott & Huizinga, 1984) and it lists 36 questions about illegal juvenile acts. Consistent with past uses of the scale (Krueger et al., 1994), drug offenses (9 items), property

offenses (10 items), status offenses (4 items), and sexual deviance (3 items) were combined to create a non-violent offenses scale. Eight items formed a violent offense scale (the one sexual deviance item, “Have you ever had sexual intercourse with someone against their will,” was eliminated due to a variance of 0). The violent delinquency scale showed moderate internal consistency ( $\alpha = .61$ ), while the non-violent scale showed good internal consistency ( $\alpha = .84$ )

*Legal History.* Following completion of the study, information about each youth was obtained from the youth’s detention center files. Chart information was used solely to determine the age at which the youth was arrested for their first offense.

*Skin Conductance (SC).* Electrodermal activity (EDA) for determining SC was recorded via two electrodes placed on the middle two distal phalanges of the non-dominant hand. Data was recorded, visually inspected, and analyzed using Thought Technology’s ProComp Infinity encoder connected to a Pentium 4 laptop computer equipped with Biograph Infinity software (version 2.0.1). Sampling was set at 256 Hz.

Participants participated in a computerized provocation task (Waschbusch et al., 2002) and were told they could win and lose points based on their response speed. Further, they were told they were competing against an opponent at another juvenile institution but, in fact, the computer was programmed with scheduled wins and losses. Eight of 16 loss trials involved a high degree of provocation, whereby a highly aversive verbal message was played from the “opponent” (e.g., “You wimp! I don't think I'll ever be beaten! Minus 100!”), and between 80 and 100 points were subtracted. For the other eight loss trials, a less provocative verbal message was broadcast (e.g., “I won but I’ll give you a break. I'll only take 10 points.”), and between 0 and 20 points were subtracted.

Psychophysiological responses were coded during each of the 16 loss trials, such that the examiner electronically marked the end of each taunt to code offline. The change (0.01 microsiemens or greater) in SC that happened between 1 and 4 seconds after each taunt were

averaged for SC reactivity (Stern, Ray, & Quigley, 2001). Prior to engagement in the task, participants rested with the electrodes for 10 minutes (measuring resting skin conductance level).

### Results

A person-centered approach to analysis was chosen, recognizing that using cut-scores on continuous dimensions can reduce the power to detect significant associations. This decision was made for two main reasons. First, although significant debate exists as to how best to conceptualize psychopathy scores, a recent taxometric study suggested high scorers on a measure of psychopathy were better considered a discrete taxon rather than simply at the upper end of a continuous dimension (Vasey, Kotov, Frick, & Loney, 2005). Second, based on our theoretical model of psychopathic traits designating a unique group of antisocial youth, we wanted a practical way to translate results into unambiguous implications for subgroups of individuals. Thus, for all analyses (using SPSS 14.0 for Windows) we performed median-splits<sup>2</sup> on the scores from the ICU and the APSD Narcissism and Impulsivity subscales to form distinct groups of detained boys.

Independent-samples t-tests were performed using PPVT-III scores as the dependent measure. There were no significant effects for callous-unemotional or narcissistic traits groups on verbal ability ( $t(98)=-0.40, p = \text{n.s.}$  and  $t(98)=-1.29, p = \text{n.s.}$ , respectively). However, higher intelligence scores were evident for the high impulsivity group ( $M=87.83, SD=15.05$ ), as compared to the low group ( $M=76.93, SD=15.25; t(98)=-3.58, p < .001$ ).

#### *Severity of Delinquent Behavior*

To test the moderating role of psychopathic traits in the link between verbal ability the severity of delinquent behavior, PPVT-III scores (measuring verbal ability) were used to form groups using a median split to maintain the person-centered approach to analyses. The three dependent measures, which indicated severity, were self-reported violent and non-violent

delinquency, and the age at first offense taken from official records. Multivariate Analyses of Variance (MANOVAs) were performed because the three dependent measures were all considered to be indicators of the same construct (i.e., severity of delinquent behavior). The MANOVA provides a method of testing overall associations with the construct, whereas follow-up analyses with individual ANOVA's test the associations with the individual indicators.

As expected, the interaction between callous-unemotional traits and verbal ability was significant (Wilks'  $\Lambda = .92$ ,  $F(3, 94) = 2.73$ ,  $p < .05$ ). Table 2 notes the results of these analyses with means for each group. Verbal ability had effects on the severity of delinquency that differed depending on the level of CU traits. However, the follow-up test revealed that the interaction was significant only for violent delinquency ( $F(1, 96) = 4.13$ ,  $p < .05$ , partial  $\eta^2 = .04$ ). The form of the interaction is illustrated in Figure 1. Relatively higher verbal ability was protective for youth who were low on callous-unemotional traits. The highest levels of violent delinquency were reported among boys with high verbal ability who were also high on callous-unemotional traits.

When narcissism was entered into a MANOVA, unexpectedly, no interaction was found. A significant main effect was found (Wilks'  $\Lambda = .73$ ,  $F(3, 94) = 11.74$ ,  $p < .001$ ), however. Boys with high narcissistic traits reported greater levels of non-violent delinquency ( $M = 11.70$ ,  $SD = 5.03$ ) than those with low narcissistic traits ( $M = 7.19$ ,  $SD = 4.46$ ;  $F(1, 96) = 19.46$ ,  $p < .001$ , partial  $\eta^2 = .17$ ). They also reported greater levels of violent delinquency ( $M = 3.15$ ,  $SD = 1.65$ ) than those with low narcissistic traits ( $M = 1.58$ ,  $SD = 1.17$ ;  $F(1, 96) = 29.73$ ,  $p < .001$ , partial  $\eta^2 = .24$ ). Similarly, there was a significant main effect for impulsivity (Wilks'  $\Lambda = .73$ ,  $F(3, 94) = 11.74$ ,  $p < .001$ ), but no significant interaction. Boys high on impulsive traits reported greater levels of non-violent ( $M = 11.74$ ,  $SD = 4.81$ ) and violent delinquency ( $M = 3.00$ ,  $SD = 1.79$ ) than those low in impulsivity ( $M = 7.24$ ,  $SD = 4.67$  and

$M=1.74$ ,  $SD=1.18$ ) ( $F(1,96)=15.01$ ,  $p < .001$ , partial  $\eta^2=.14$ ;  $F(1,96)=18.41$ ,  $p < .001$ , partial  $\eta^2=.16$ , respectively).

#### *Skin Conductance Activity and Reactivity*

As predicted, a group of boys high on both callous-unemotional traits and verbal ability showed the highest levels of violent delinquency. Next, we tested the hypothesis that psychophysiological indices of low arousal could explain the greater violent behavior in this group. A MANOVA was performed using callous-unemotional traits and verbal ability as predictors. Three dependent measures indicating activity/reactivity were resting SC and SC reactivity in response to low and high provocation. Table 2 shows the results of the analysis. As predicted, the interaction was significant (Wilks'  $\Lambda = .91$ ,  $F(3, 87)=2.77$ ,  $p < .05$ ), such that the effect of verbal ability on activity/reactivity differed depending on the level of callous-unemotional traits. Follow-up analyses revealed that only the analyses predicting SC reactivity to high provocation was significant ( $F(1,98)=4.45$ ,  $p < .05$ , partial  $\eta^2=.05$ ). The form of this interaction is illustrated in Figure 2. As expected, the lowest mean reactivity was found for the group of youth who were high on callous-unemotional traits and with relatively stronger verbal abilities.

#### Discussion

The results of the present study support the importance of the construct of psychopathy, and particularly the callous-unemotional (CU) dimension, for understanding the association between verbal ability and delinquency. Consistent with the results of Johansson and Kerr's (2005) study, high verbal ability was only associated with reduced risk for violent delinquency in detained boys that were low on CU traits. Boys with higher levels of these traits and higher verbal ability showed the highest rate of violent delinquency.

These findings are consistent with a long history of clinical descriptions of psychopathic individuals as showing severe antisocial behavior, despite having an absence of

the cognitive impairments that are often present in other offenders (Cleckley, 1976; Salekin et al., 2004). Also consistent with this conceptualization, boys in our detained sample who were high on CU traits and with relatively unimpaired verbal abilities also showed reduced reactivity to provocation. This low reactivity is consistent with prior research showing reduced reactivity to different types of negative emotional stimuli in persons high on psychopathic traits, despite being highly aggressive (Kimonis et al., 2006; Loney et al., 2003). Reduced emotional reactivity is also consistent with several theories proposed to explain the development of CU traits. These theories focus on a specific temperamental style characterized by reduced psychophysiological reactivity to negative stimuli that hinder the development of appropriate levels of empathy and guilt (Blair, 2006; Frick & Morris, 2004; Frick, 2006).

These results need to be interpreted in the context of a number of limitations. First, the average level of verbal abilities in our sample was more than one standard deviation below the national norm. Thus, the group higher on verbal ability should not be considered as being “high” in absolute terms but should only be considered “higher” than other detained adolescents. Second, our sample was predominantly African-American. This demographic composition is representative of the detained population in the region in which the sample was recruited and it provides data on the importance of the construct of psychopathy in ethnic minority samples (Kimonis et al., 2006). However, it could potentially limit the generalizability of our findings to samples with different ethnic compositions. Also, related to the generalizability of the findings, it is not clear how well these findings might replicate in more normative samples. Third, it is important to note that not all of our findings were consistent with hypotheses. Specifically, there was no interaction between verbal ability and psychopathic traits in predicting age of onset of delinquent behaviors, which is inconsistent with the findings of Johansson and Kerr (2005). Also, this was the only measure that did not

rely on self-report. Thus, some shared method variance could account for the findings regarding severity of delinquency. Fourth, the current study was cross-sectional in design and thus, the use of the term “prediction” can only appropriately refer to statistical prediction. The results neither address the temporal ordering of variables nor the causal relations among variables.

In the context of these limitations, the results do support the growing literature suggesting psychopathic traits, and in particular CU traits, may designate a distinct group of antisocial and delinquent youth with specific risk factors associated with their problem behaviors (Viding, 2004; Blair, Peschardt, Budhani, Mitchell, & Pine, 2006; Frick, 2006). This diversity in risk factors could suggest both differences in the causal mechanisms leading to problem behavior and the need for different interventions for youth with and without these traits. For example, youth with limited verbal abilities may require interventions focused on overcoming their verbal deficits and the problems that may result from these deficits, such as poor school achievement or executive functioning problems (Frick & Marsee, 2006). In contrast, youth with callous-unemotional traits may require interventions that focus directly on overcoming their emotional deficits or problems that result from them, such as lack of guilt and empathy (Dadds et al., 2006; Frick, 2006). Finally, in the context of risk assessment, these findings illustrate how a risk factor like low verbal ability needs to be interpreted within the context of distinct subgroups of antisocial individuals. That is, even a risk factor as robust as low verbal ability cannot be assumed to be related to risk for violence in all antisocial youth.



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## Footnotes

<sup>1</sup>The use of psychotropic medication was unrelated to any of our independent measures. Thus, all analyses were performed without regard to use of medication.

<sup>2</sup>Analyses were repeated using hierarchical multiple regressions including interactions, but the variances explained in the case of each interaction were unremarkable for CU ( $\Delta R^2$  ranged from .00 to .02), narcissism (ranged from .00 to .01), and impulsivity (ranged from .00 to .03). None reached significance.



Table 1. Distribution of Main Study Variables

Measures	N	Mean	SD	Skewness		Kurtosis	
				Statistic	SE	Statistic	SE
Narcissism	100	4.02	2.87	0.49	0.24	-0.73	0.48
Impulsivity	100	4.24	2.17	0.15	0.24	-0.45	0.48
ICU	100	23.36	8.05	-0.02	0.24	0.26	0.48
PPVT - Standard Score	100	81.94	16.04	0.22	0.24	0.09	0.48
Non-violent Delinquency	100	9.31	5.23	0.41	0.24	-0.90	0.48
Violent Delinquency	100	2.32	1.61	0.83	0.24	0.02	0.48
Age at First Offense	100	12.68	2.37	-0.81	0.24	0.38	0.48
Resting Skin Conductance Level	98	3.75	2.25	1.0	0.24	1.45	0.48
Skin Conductance Reactivity – Low Provocation	96	.07	0.07	1.11	0.25	0.55	0.49
Skin Conductance Reactivity – High Provocation	98	.12	0.11	1.02	0.24	0.62	0.48

Note: ICU=Inventory of Callous-Unemotional Traits (Frick, 2003); PPVT=Peabody Picture Vocabulary Test (Dunn & Dunn, 1997).

Table 2. The Interactive Effect of Callous-Unemotional Traits and Verbal Ability on Delinquent Behavior and Skin Conductance

Activity/Reactivity with Means and Standard Deviations (in parentheses) Noted.

	Calm-Unemotional Traits						
	<u>Low</u>		<u>High</u>				
	Verbal Ability		Verbal Ability				
Severity of Delinquent Behavior	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>	<i>F</i>	<i>df</i>	<u>Partial</u> <u>Eta</u> <sup>2</sup>
	(n=30)	(n=25)	(n=21)	(n=24)			
Non-violent Delinquency	6.13 (3.61)	10.76 (5.21)	8.62 (5.19)	12.38 (4.86)	0.35	1, 96	.00
Violent Delinquency	2.40 (1.67)	1.92 (1.44)	2.05 (1.63)	2.88 (1.62)	4.13*	1, 96	.04
Age of First Offense	12.07 (2.35)	13.08 (2.29)	12.81 (2.52)	12.92 (2.32)	0.90	1, 96	.01
Skin Conductance Activity/Reactivity	(n=26)	(n=23)	(n=20)	(n=24)			
Resting	3.35 (2.07)	3.84 (2.43)	4.30 (2.49)	3.11 (1.66)	3.47	1, 89	.04
Reactivity - Low Provocation	0.07 (0.07)	0.08 (0.07)	0.07 (0.06)	0.04 (0.07)	1.01	1, 89	.01
Reactivity - High Provocation	0.11 (0.09)	0.14 (0.11)	0.14 (0.11)	0.08 (0.07)	5.03*	1, 89	.05

Note: The results shown are from follow-up tests after 2x2 MANOVAs predicting delinquency and skin conductance activity/reactivity showed significant interactions (Wilks'  $\Lambda = .92$ ,  $F(3, 94) = 2.73$ ,  $p < .05$ , Wilks'  $\Lambda = .91$ ,  $F(3, 87) = 2.77$ ,  $p < .05$ , respectively); \*  $p < .05$ .

Figure Captions

*Figure 1.* Callous-unemotional traits by intelligence predict violent delinquency.

*Figure 2.* Callous-unemotional traits by intelligence predict skin conductance reactivity to high provocation.



